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## PATENT ABSTRACTS OF JAPAN

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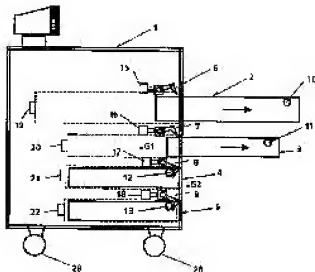
(21)Application number : 09-028217 (71) FUJI XEROX CO LTD  
 (22)Date of filing : 12.02.1997 (72)Inventor : KURODA MITSUAKI

## (54) IMAGE FORMING DEVICE

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To simultaneously pull out plural drawers while preventing the overturning of an image forming device by providing a drawing-out inhibiting means for inhibiting the pulling out of drawers other than the drawer pulled out at present, with the result of discrimination by a drawing-out propriety discriminating means.

**SOLUTION:** The outputs of drawer sensors 19-22 are supplied to a microprocessor and a driving circuit for driving respective solenoids 15-18 is controlled by the microprocessor. When the fact that the drawers 2 and 3 are simultaneously pulled out is detected by the drawer sensors 19 and 20, the driving circuit is driven by the microprocessor to actuate the solenoids 17 and 18 and pins 12 and 13 as the drawing out inhibiting means for the drawers 4 and 5 are locked by locking mechanisms 8 and 9. Therefore, when the drawers 2 and 3 are simultaneously pulled out, both of the drawers 4 and 5 can not be pulled out to prevent the overturning of a main body.





JAPANESE

[JP,10-221911,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL  
FIELD PRIOR ART EFFECT OF THE INVENTION  
TECHNICAL PROBLEM MEANS EXAMPLE  
DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

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## DETAILED DESCRIPTION

[Detailed Description of the Invention]

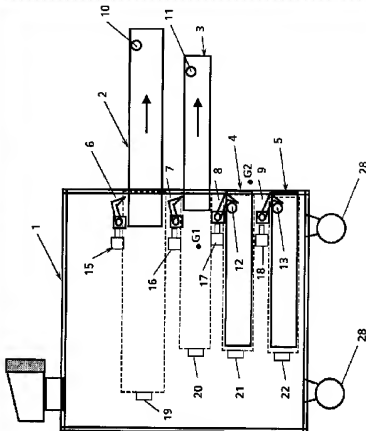
[0001]

[Field of the Invention]About the image forming device with which two or more units, such as a paper tray, a paper sheet conveying device, and an anchorage device, were provided to the device main frame as a drawer in which a drawer is free, this invention relates to the image forming device provided with the safety against overturning for preventing a device from falling, when a drawer is pulled out especially.

[0002]

[Description of the Prior Art]For example, in image forming devices, such as a copying machine and a printer, two or more units, such as a paper tray, a paper sheet conveying device, and an anchorage device, are provided to the device main frame as a drawer in which a drawer is free so that maintenance inspection work etc. can be performed easily. In the image forming device provided with the drawer in which such a drawer is free, when removing the time of maintenance inspection, or the choked paper at the time of feeding, it works by pulling out a predetermined drawer, for

Drawing selection **Representative draw**



[Translation done.]

example. If a drawer is pulled out, the center of gravity of a drawer will move to the near side of an image forming device, and will also move the center of gravity of the whole image forming device to a device near side, but, the field surrounded by two or more legs in which the center of gravity of the whole image forming device supports an image forming device also in the state where the drawer was pulled out, in an anticipated-use state, i.e., the state where only one drawer is pulled out, -- since it is inside enough, a problem in particular is not produced.

[0003]However, when two or more drawers are pulled out simultaneously, there is a possibility that the center of gravity of the whole image forming device may move to a near side from the field surrounded by two or more legs which support an image forming device, and an image forming device may fall to a near side.

[0004]So, when one drawer is pulled out as indicated to JP,6-242641,A in order to solve such a problem. The locking mechanism that other drawers are not pulled out is established and preventing from pulling out two or more drawers simultaneously is known.

[0005]

[Problem(s) to be Solved by the Invention]However, it may be necessary to pull out two or more drawers simultaneously in the case of actual maintenance inspection work. For example, where a paper is straddled [ two drawers ], when a paper jam is caused, it is necessary to pull out two applicable drawers simultaneously and to remove the choked paper. In such a case, in composition given in above-mentioned JP,6-242641,A, since two drawers cannot be simultaneously pulled out when a device does not fall, even if it pulls out two drawers simultaneously, there is a problem that the workability of maintenance inspection falls.

[0006]Then, an object [ preventing the fall of an image forming device ] of this invention is to enable it to pull out two or more drawers simultaneously.

[0007]

[Means for Solving the Problem]This invention is characterized by that an image forming device with which two or more units were provided to a device main frame as a drawer in which a drawer is free comprises the following in order to attain said purpose.

A drawer state detecting means which detects a drawer state of each drawer.

A drawer propriety discriminating means which distinguishes whether it is possible to pull out another drawer based on a detection result by said drawer state detecting means.

A drawer inhibiting means which forbids a drawer of drawers other than a drawer pulled out now when it is

distinguished that it is impossible to pull out another drawer by said drawer propriety discriminating means.

[0008]This invention provided a landing gear part which two or more units are interlocked with a drawer of a drawer in an image forming device formed to a device main frame as a drawer in which a drawer is free, and projects in a near side of a device main frame.

[0009]This invention formed weight with which two or more units interlock and descend to a drawer of a drawer in an image forming device formed to a device main frame as a drawer in which a drawer is free in the back side inside a device main frame.

[0010]

[Example]Hereafter, based on an example, the feature of this invention is explained concretely, referring to drawings.

[0011]Drawing 1 is an outline lineblock diagram of the 1st example of the image forming device of this invention. The drawer in which a cash drawer of 1 is [ an image forming device body, and 2-5 ] possible in drawing 1. A solenoid for a pin to lock 6-9 according to a locking mechanism, and for 10-13 lock each drawer according to the locking mechanisms 6-9, and 15-18 to operate the locking mechanisms 6-9, and 19-22 are drawer sensors which detect that the drawers 2-5 were pulled out. The leg 28 which has the caster structure for making movement of an image forming device easy is formed in the pars basilaris ossis occipitalis of the image forming device body 1.

[0012]Drawing 2 is a mimetic diagram showing a locking mechanism. Since the locking mechanisms 6-9 have the same mechanism, if the locking mechanism 6 is mentioned as an example and it explains, the latch claw 6a which engages with the pin 10 of the drawer 2 is formed focusing on the axis 6b, enabling free rotation. The latch claw 6a rotates by pressing the pressure receptacle member 6c provided in the axis 6b with the plunger 15a of the solenoid 15.

That is, after the plunger 15a of the solenoid 15 has retreated, the latch claw 6a separates from the pin 10, and the drawer 2 becomes withdrawal, and after the plunger 15a has projected, the latch claw 6a engages with the pin 10, the drawer 2 pulls out, and it becomes impossible.

[0013]Drawing 3 is a block diagram showing the control circuit in the 1st example. The output of the drawer sensors 19-22 is supplied to the microprocessor 23, and the drive circuits 24-27 which drive each solenoids 15-18 are controlled by this microprocessor 23. CPU, ROM, RAM, an interface, etc. are built in the microprocessor 23 as everyone knows.

The combination of the drawer which can be pulled out

without making ROM reverse an image forming device so that it may mention later is recorded.  
 For example, in this example, the combination of a withdrawal drawer is as being shown in the following table 1. The round mark in front shows the drawer pulled out.

[0014]

[Table 1]

ドローワー				引き出し
2	3	4	5	
○				可
	○			可
		○		可
			○	可
○	○			可
○		○		可
○			○	可
	○	○		可
	○		○	可
		○	○	可
○	○	○		不可
○	○		○	不可
○		○	○	可
○	○	○	○	不可

Namely, although the drawer 2 and the drawer 3 can be pulled out simultaneously, If the drawer 4 or the drawer 5 is pulled out further, the center of gravity G2 of the whole image forming device is setting out that move to the near side of the field surrounded by two or more legs 28 which support the image forming device body 1, and an image forming device falls to a near side. It may be made to record the combination of this drawer on the nonvolatile memory by which external was carried out to the microprocessor 23.  
 [0015]In a normal state, all the locking mechanisms 6-9 are lock released conditions, and can pull out arbitrary drawers. Since considering the case where the drawer 2 and the drawer 3 are pulled out simultaneously now the combination of this drawer has satisfied withdrawal conditions, the drawer 2 and the drawer 3 can be pulled out simultaneously.  
 [0016]Although the center of gravity of the whole image forming device is also moved to a device near side, since there is the center of gravity G1 of the whole image forming device also in the state where the drawer 2 and the drawer 3

were pulled out simultaneously, inside the field surrounded by two or more legs 28 which support the image forming device body 1, an image forming device does not fall.

[0017]When it is detected by the drawer sensors 19 and 20 that the drawer 2 and the drawer 3 were pulled out simultaneously, the drive circuits 26 and 27 drive by the microprocessor 23, the solenoids 17 and 18 operate, and the pins 12 and 13 of the drawers 4 and 5 are locked by the locking mechanisms 8 and 9. Therefore, when the drawer 2 and the drawer 3 are pulled out simultaneously, all of the drawers 4 and 5 are pulled out and it becomes impossible. Thereby, a main part can be prevented from falling.

[0018]Drawing 4 which can distinguish whether it is possible to make weighting the height in which each drawer is located, to attach high dignity as the drawer in which it is located [ upper ], and to pull out another drawer is an outline lineblock diagram of the 2nd example of the image forming device of this invention. Identical codes are given to the 1st example shown in drawing 1, and a corresponding member. In the 2nd example, when each drawer is pulled out at the end by the side of the drawer of each drawer stowage of the image forming device body 1, the weight detecting sensors 29-31 for detecting the weight of each drawer containing the weight of a paper are formed.

[0019]And when the sum total of the weight concerning these weight detecting sensors 29-32 pulls out the drawer of further others and it becomes the weight which an image forming device body reverses, the locking mechanism of a drawer which is not pulled out operates and it prevents from pulling out.

[0020]Drawing 5 is an outline lineblock diagram of the 3rd example of the image forming device of this invention. Identical codes are given to the 1st example shown in drawing 1, and a corresponding member. In the 3rd example, it is connected via the link member 33 to the drawer 2 of the topmost part of the image forming device body 1, The drawer member 34 which is interlocked with the drawer state of the drawer 2 and moves was formed, and the landing gear part 35 for falling preventives is formed in the undersurface of the end of the near side of this drawer member 34. This landing gear part 35 has caster structure like the leg 28.

[0021]In the example shown in drawing 5, since the drawer member 34 which is interlocked with this and has the landing gear part 35 will also be pulled out to the front if the drawer 2 is pulled out, even if the center of gravity of an image forming device moves to the front from the leg 28, an image forming device does not fall.

[0022]Drawing 6 is an outline lineblock diagram of the 4th

example of the image forming device of this invention. Identical codes are given to the 1st example shown in [drawing 1](#), and a corresponding member. In the 4th example, the drawer 2 of the topmost part of the image forming device body 1 and the drawer 5 of the bottom are connected via the link member 36. The assistant leg 30 and the same landing gear part 37 for falling preventives are formed in the undersurface of the end of the near side of the drawer 5 of the bottom.

[0023]In the example shown in [drawing 6](#), since the drawer 5 of the lower berth which is interlocked with this and has the landing gear part 37 will also be pulled out to the front if the drawer 2 is pulled out, even if the center of gravity of an image forming device moves to the front from the leg 28, an image forming device does not fall.

[0024][Drawing 7](#) is an outline lineblock diagram of the 5th example of the image forming device of this invention. Identical codes are given to the 1st example shown in [drawing 1](#), and a corresponding member. In the 5th example, the pulley 38 is formed in the inner part of the seat part of the drawer 2 of the topmost part of the image forming device body 1, and the tip of the wire 39 wound around this pulley 38 is connected with the end by the side of the back of the topmost drawer 2. The wire 40 is wound around the pulley 38 in the same direction as the wire 39. The weight 41 is connected at the tip of this wire 40.

Torque is given in the direction which lifts the weight 41 by the spiral spring etc. which do not illustrate the pulley 38.

[0025]In the state where it was stored, the anticipated-use state 2, i.e., a drawer, has the wire 39 and the wire 40 in the state where it was wound around the pulley 38. If the drawer 2 is pulled out, the wire 39 will be pulled and the pulley 38 will rotate in the clockwise direction in a figure. Thereby, the wire 40 lets out from the pulley 38 and the weight 41 descends. Therefore, the center of gravity of an image forming device moves caudad, and it becomes difficult to reverse an image forming device.

[0026]

[Effect of the Invention]Since two or more drawers can be simultaneously pulled out if it is the combination which a main part does not reverse in this invention as stated above, a check maintenance service can be performed efficiently.

[0027]When a drawer is pulled out, the fall of a device can be prevented by being interlocked with this and pulling out a landing gear part.

[0028]When a drawer is pulled out, the fall of a device can be prevented by lowering the center of gravity of a device.

[Translation done.]





JAPANESE

[JP,10-221911,A]

Drawing selection

Representative draw

CLAIMS DETAILED DESCRIPTION TECHNICAL  
FIELD PRIOR ART EFFECT OF THE INVENTION  
TECHNICAL PROBLEM MEANS EXAMPLE  
DESCRIPTION OF DRAWINGS DRAWINGS

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**DESCRIPTION OF DRAWINGS**

[Brief Description of the Drawings]

[Drawing 1] It is an outline lineblock diagram of the 1st example of the image forming device of this invention.

[Drawing 2] It is a mimetic diagram showing a locking mechanism.

[Drawing 3] It is a block diagram showing the control circuit in the 1st example.

[Drawing 4] It is an outline lineblock diagram of the 1st example of the image forming device of this invention.

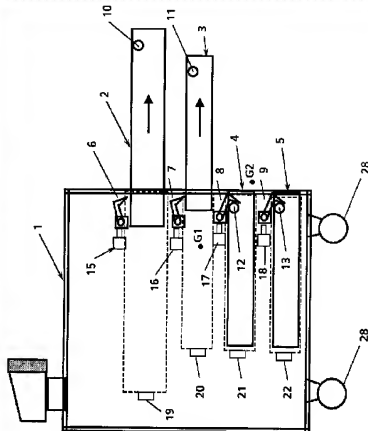
[Drawing 5] It is an outline lineblock diagram of the 2nd example of the image forming device of this invention.

[Drawing 6] It is an outline lineblock diagram of the 3rd example of the image forming device of this invention.

[Drawing 7] It is an outline lineblock diagram of the 4th example of the image forming device of this invention.

[Description of Notations]

1 -- An image forming device body, 2-5 -- The drawer in which a cash drawer is possible, 6-9 -- Locking mechanism, 10-13 -- A pin, 15-18 -- A solenoid, 19-22 -- Drawer sensor, 23 -- A weight detecting sensor, 33 / -- A link member,



[Translation done.]

34 / -- A drawer member, 35 / -- A landing gear part, 36 / --  
A link member, 37 / -- A landing gear part, 38 / -- A pulley,  
39 / -- A wire, 40 / -- A wire, 41 / -- Weight ] -- A  
microprocessor, 24-27 -- A drive circuit, 28 -- The leg, 29-  
32

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[Translation done.]

JAPANESE

[JP,10-221911,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD  
PRIOR ART EFFECT OF THE INVENTION TECHNICAL  
PROBLEM MEANS EXAMPLE DESCRIPTION OF  
DRAWINGS DRAWINGS

[Translation done.]

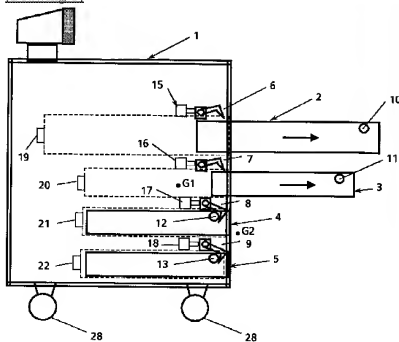
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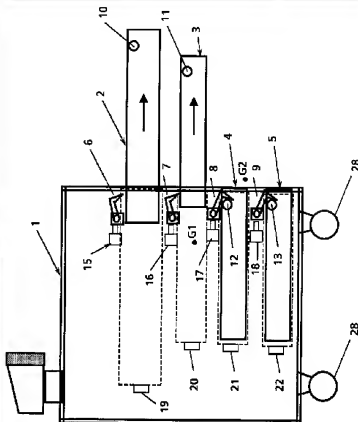
## DRAWINGS

[Drawing 1]

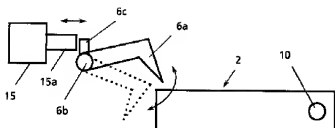


[Drawing 2]

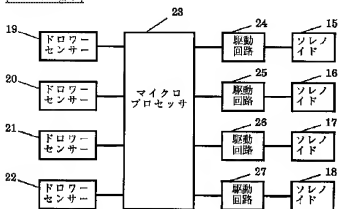
Drawing selection Representative draw



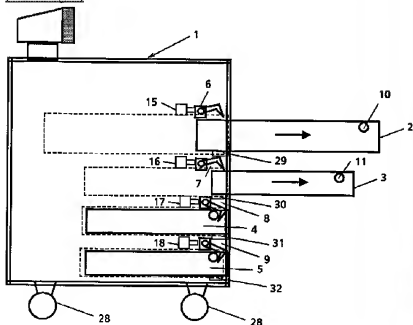
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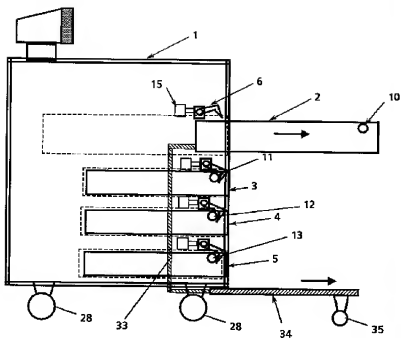
[Drawing 3]



[Drawing 4]



[Drawing 5]



[Drawing 6]

